

Patterns and Textures: Who Took the Pets?

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Science Objective

Children use observations and techniques to explore patterns and textures, including details that are not easily visible to the eye. They explore patterns and textures of leaves and fingerprints, using rubbings and carbon printing. Leaves have veins that have different patterns: parallel venation, pinnate venation, and palmate venation. Scientists use venation to identify plants. Fingerprints have unique patterns that appear when fingers are pressed into black powder and then onto paper. Children also learn about symmetry. Symmetry is another kind of pattern.

iScience Puzzle: Missing Animals!

This science puzzle requires children to figure out what happened to some animals that disappeared from a pet-food store. To solve the puzzle, they will need to learn about patterns. Patterns appear in designs and structures of living forms. They can also appear in behavior. As they continue reading, children learn about some patterns that will help them solve the puzzle.

Objectives ► Children will:

- look for patterns in behaviors and in objects.
- use patterns of veins in leaves to identify and categorize them.
- examine textures of objects.
- use carbon printing to make fine details in fingerprints visible.
- explore how mirrors reverse images.
- find examples of symmetry.

Lesson Plan

Before Reading

Investigation

Ask children to describe their morning routine. Ask: *Do you do the same thing each morning at the same time? Is your routine a pattern?* Ask children to name other patterns. Write them on the board under the headings *Designs, Structures, Behaviors*. Some examples might include: checkerboard pattern (*Designs*), fish scale pattern (*Structures*), and brushing teeth every morning (*Behaviors*).

Science Concepts

Routines are a pattern of behavior. Patterns appear in designs and structures of objects in both the natural and human-made worlds.

Explain that children will explore patterns and textures in the world around them. Patterns can be repeated designs, structures, or behaviors. They can be explored through our senses of sight, touch, and sound. They can also be explored through scientific thinking based on observation, predictions, and evaluation of evidence.

During Reading

Investigation

pp. 6–8: Ask: *What do the puzzle options have to do with patterns?*

Science Concepts

Repeated actions are a form of pattern.

pp. 9–10: Ask: *What can looking at the pictures on these two pages tell you about patterns?*

Things are not always what they seem to be at first.

pp. 11–13: Have children add more examples of patterns of behavior in the chart begun in the Before Reading section. Extend the discussion to plants. Ask: *Do plants flower in a time pattern of days or seasons?*

Patterns of behavior provide clues about living forms.

pp. 14–15: Ask: *How can you use patterns in leaf veins to tell more about a plant?*

Leaves have three types of venation: parallel, pinnate, and palmate.

pp. 16–17: Have children describe in their own words what they see in the rubbings. Restate their responses, using the terms *veins, venation, patterns, and textures*. Repeat the activity using different leaves.

Rubbings make patterns and textures more apparent. Raised areas are darker than flat surfaces.

pp. 18–19: Pass around several objects and have children describe their textures. Tell them to think like scientists. Ask: *What do textures tell you about the objects?*

All objects have textures, such as smooth, rough, coarse, fine, etc.

During Reading (continued)

Investigation

Science Concepts

pp. 20–22: Ask: *Can you see patterns in your fingerprints?*

Carbon printing makes fine lines visible. Fingerprints are based on patterns of whorls, loops, and arches.

p. 23: Print uppercase letters A, H, M, O, W, and X on the board. Have children draw a line of symmetry down the center of each letter.

Symmetrical objects have the same shape or pattern on opposite sides of a center line.

pp. 24–25: Have children explore reverse images by holding a mirror up to words. Ask: *Can you change the way objects look by using a mirror?*

Mirrors reverse images. Depending on the way a mirror is held, objects can appear distorted.

p. 26: Have children use the clues on page 26 and make a prediction about what happened at the store before they continue reading. Then check their predictions as they continue reading.

Making and checking predictions is part of the scientific method.

pp. 27–28: Review the three theories and discuss the patterns that helped eliminate or support each one.

Patterns can help solve mysteries.

After Reading

Restate the key ideas in this book. Patterns are found in designs, structures of the natural and human-made worlds, and actions. Leaves can be divided according to their venation: parallel, pinnate, and palmate. Studying venation can tell us how the plant carries water from roots to leaves. Patterns can be made more visible by making rubbings or by carbon printing. Some objects are symmetrical; opposite sides are the same. Mirrors reflect objects and reverse the images.

Investigation

Understanding Science

Have children make rubbings of other objects, including coins, bark, shells, and rocks. Suggest that they use colored pencils and chalk to create works of art.

Rubbings show fine details more clearly.

Provide children with small mirrors and have them use the mirrors to write letters and words backwards and upside down.

Mirrors reverse images and words.